

REMARKS

In the Office Action, claims 1-17, 28-31, 34-36, and 39 were rejected. By the present Response, claims 1, 30, and 35 are amended and claim 7 is canceled. Applicants respectfully submit that no new matter is added by the present amendments. Upon entry of the amendments, claims 1-6, 8-17, 28-31, 34-36, and 39 will remain pending in the present patent application. In view of the foregoing amendments and the following remarks, Applicants respectfully request reconsideration and allowance of all pending claims.

Rejections Under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 1-5, 9, 14-16, 28-31, 34-36, and 39 under 35 U.S.C. § 102(b) as being anticipated by Kano et al., U.S. Patent No. 5,359,513 (hereinafter "Kano"). Applicants respectfully disagree and traverse this rejection for at least the reasons discussed below.

Legal Precedent

Anticipation under Section 102 can be found only if a single reference shows exactly what is claimed. *See Titanium Metals Corp. v. Banner*, 227 U.S.P.Q. 773 (Fed. Cir.1985). For a prior art reference to anticipate under Section 102, every element of the claimed invention must be identically shown in a single reference. *See In re Bond*, 15 U.S.P.Q.2d 1566 (Fed. Cir.1990). That is, the prior art reference must show the *identical invention "in as complete detail as contained in the ... claim"* to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989) (emphasis added). Thus, for anticipation, the cited reference must not only disclose all of the recited features but must also disclose the *part-to-part relationships* between these features. *See Lindermann Maschinenfabrik GMBH v. American Hoist & Derrick*, 221 U.S.P.Q. 481, 486 (Fed. Cir.1984). Accordingly, Applicants need only point to a single element or claimed relationship not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter.

Independent Claims 1, 30, and 35

As an initial matter, Applicants note that claim 7, which depends from claim 1, recites “generating a temporal change image based upon *first and second images* from different times ... wherein the *first and second images are generated by different imaging modalities*.” (Emphasis added). In the Office Action, the Examiner rejected dependent claim 7 under 35 U.S.C. § 103(a) as being obvious in view of the combined teachings of Kano and Roehrig et al., U.S. Patent No. 7,054,473 (hereinafter “Roehrig”). In particular, the Examiner admitted that Kano fails to teach “first and second images generated by *different imaging modalities*,” but alleged that this subject matter is disclosed in Roehrig, which generally disclose various techniques for normalizing medical images to create a uniform display tone. *See* Office Action, page 5. To support the foregoing assertion, the Examiner cited to the following passage of Roehrig:

The processes described above with respect to FIGS. 1-5 apply generally to all medical images, regardless of modality and anatomical features being examined. It should be understood that these processes are modality and feature independent. However, an overview example discussing CT scans is described below with respect to FIG. 10, and a detailed example is provided below, in FIGS. 6 and 7 showing the pre- and post-processing used for a mammogram or a chest x-ray. These are merely exemplary processes. One of skill in the art would understand how to extend them to other modalities and features.

Roehrig, col. 14, lines 23-33.

After carefully reviewing the subject matter disclosed by Roehrig, Applicants are unable to identify any teaching in the cited paragraph or elsewhere, which appears to teach or suggest first and second images used in generating a temporal change image are each acquired using *different imaging modalities*. That is, Roehrig fails to teach that a first image is acquired

using a *first* imaging modality and that a second image is acquired using a *second* imaging modality, the first and second imaging modalities being different.

Instead, Applicants note that the passage relied upon by the Examiner appears merely to suggest that the disclosed normalization techniques are applicable all medical images acquired using various types of imaging modalities. For instance, Figs. 8A and 8B of Roehrig illustrate normalization techniques being applied to breast mammogram images acquired using X-ray techniques. Figs. 8C and 8D of Roehrig illustrate normalization techniques being applied to chest X-ray images. The Roehrig reference appears to further mention that the disclosed normalization techniques are also applicable to images acquired using computed tomography imaging (CT). However, Roehrig does not appear to suggest that a *first and a second image* used in generating a temporal change image are acquired using different imaging modalities (e.g., acquired using a *combination* of different modalities). Rather, the Roehrig reference appears to merely state that different modalities may be used *instead of or as an alternative* to the modalities discussed in the provided examples (e.g., X-rays or CT). Accordingly, Applicants submit that Roehrig fails to disclose *first and second* images being acquired by *different* modalities, as recited by dependent claim 7. As such, the subject matter set forth by claim 7 is believed to be allowable over the combination of Kano and Roehrig.

Therefore, although Applicants do not necessarily agree with the Examiner's present rejection of claims 1, 30, and 35, Applicants have elected to cancel claim 7 and to incorporate the subject matter previously recited by claim 7 into each of independent claims 1, 30, and 35. For instance, independent claim 1, as amended, recites a method comprising, *inter alia*, "generating a temporal change image based upon first and second images from different times ... wherein the first and second images are generated by *different imaging modalities*." (Emphasis added). Amended independent claims 30 and 35 recite similar subject matter and are directed towards a system and a computer program, respectively, adapted to perform the method recited by amended independent

claim 1. Because neither Kano nor Roehrig are believed to disclose the above recited feature, as discussed above, Applicants respectfully submit that independent claims 1, 30, and 35 are presently in condition for allowance. As such, Applicants respectfully request withdrawal of the Section 102 rejections and allowance of independent claims 1, 30, and 35, as well as those claims depending therefrom.

Independent Claims 9, 31, and 36

Independent claim 9 recites a method comprising, *inter alia*, “analyzing a *first image* via at least *one CAD algorithm* to identify a feature of interest ... and *if* a feature of interest is identified in the first image, accessing a second image ... and generating a temporal change image based upon the first and second images.” (Emphasis added). Independent claims 31 and 36 recite similar subject matter and are directed towards a system and a computer program, respectively, adapted to perform the method recited by independent claim 9. Thus, each of these claims requires using the results of a CAD analysis on a first image as a *triggering* event for accessing a second image and generating a temporal change image based on the first and second images. That is, claims 9, 31, and 36 would require that if a feature of interest is *not* identified, a second image need not be accessed and, consequently, a temporal change image need not be generated. Applicants respectfully submit that Kano fails to disclose at least these features.

First, Applicants note that Kano appears to *only* disclose that a CAD algorithm may be applied as a post-processing step to a resulting *subtraction image* (which the Examiner correlated to the recited “temporal change image”) generated from first and second temporally sequential images. In setting forth the present rejection, the Examiner relied on the following passage of Kano, which states:

Post-processing can be performed after the subtraction of the two images in order to more effectively visualize interval changes, or to extract quantitative information about detected interval changes. Examples include

windowing, edge enhancement or blurring, and/or thresholding. Also, existing *computer-aided diagnosis (CAD) schemes* for the detection of abnormalities in chest images, as described in U.S. Pat. Nos. 4,907,156; 4,839,807; 5,072,384 and copending U.S. application Ser. Nos. 07/617,080 and 07/843,715, for example, *can also be applied as post-processing of the subtraction images.*

Kano, col. 14, lines 3-14. (Emphasis added.)

These teachings appear to be in direct contrast to the recited subject matter which, as discussed above, requires the use of a CAD algorithm in analyzing a first image *prior* to generating a temporal change image (e.g., subtraction image). Indeed, Applicants are unable to identify any teaching in the cited paragraph or elsewhere which suggests that a CAD algorithm is used to analyze either of the *first image* or the *second image* used in generating the subtraction image, as would be required by independent claims 9, 30, and 34.

Second, Applicants further submit that Kano fails to teach or suggest that a temporal change image is generated *conditionally* on the detection of a feature of interest in a first image by a CAD algorithm. As noted above, Kano appears *only* to suggest that a CAD analysis is performed *after* a subtraction image is *already generated* from first and second images. Applicants are unable to locate any teaching in Kano which suggests that the subtraction image is generated based on the results of a CAD analysis on either the first or second images.

In view of these deficiencies, among others, Applicants submit that Kano cannot anticipate independent claims 9, 31, or 36. As such, Applicants respectfully request withdrawal of the Section 102 rejections and allowance of independent claims 9, 31, and 36, as well as those claims depending therefrom.

Independent Claims 28, 34, and 39

Independent claim 28 recites a method comprising, *inter alia*, “analyzing a *first image* via at least *one CAD algorithm* to identify a feature of interest ... and *if* a feature of interest is identified in the first image, accessing a second image from a different time than the first image and analyzing the first and second images.” (Emphasis added). Independent claims 34 and 39 recite similar subject matter and are directed towards a system and a computer program, respectively, adapted to perform the method recited by independent claim 28. In other words, each of these claims requires using the results of a CAD analysis on a first image as a triggering or conditional event for accessing a second image and analyzing the first and second images. Applicants respectfully submit that Kano fails to disclose least the above-recited features.

As discussed above with regard to the rejections of independent claims 9, 31, and 16, the Kano reference fails to disclose analyzing the *first image* using a CAD algorithm. Rather, to the extent that Kano discusses the use of CAD algorithm in the analysis of images, it appears that Kano *only* discloses that a CAD algorithm may be used to analyze the *resulting subtraction image* generated using first and second images. However, Kano fails to make any mention regarding the use of a CAD algorithm in analyzing either of the first or second images used to generate the subtraction image, which the Examiner has alleged as being analogous to the recited “temporal change image.” Further, because Kano fails to disclose performing CAD analysis on the *first image*, Applicants submit that Kano cannot possibly be construed as disclosing that a second image from a different time than the first image is accessed and that the first and second images are analyzed *conditionally* on the detection of a feature of interest in a first image by a CAD algorithm.

Thus, in view of these deficiencies, among others, Applicants submit that the Examiner’s reliance on Kano in rejecting independent claims 28, 34, and 39 is improper. Accordingly, Applicants respectfully request withdrawal of the Section 102 rejections and allowance of independent claims 28, 34, and 39, as well as those claims depending therefrom.

Rejections Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 6-8, 10-12, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Kano in view of Roehrig; and rejected claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Kano in view of Roehrig and further in view of Nishikawa et al., U.S. Patent No. 5,598,481 (hereinafter “Nishikawa”). Applicants respectfully traverse these rejections.

Legal Precedent

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). To establish a *prima facie* case, the Examiner must not only show that the combination includes all of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). In establishing a *prima facie* case for obviousness, “the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined.” *KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 at 1729 (2007).

Dependent Claims 6-8

With the foregoing legal tenets in mind, Applicants respectfully note that claims 6-8 depend from claim 1. As indicated in the Office Action, the Examiner’s rejection of dependent claims 6-8 under Section 103 is based on the Kano reference in combination with the Roehrig reference. *See* Office Action, page 5. However, as discussed above, Kano does not disclose *each and every* feature recited by independent claim 1. Specifically, Kano fails to teach or suggest that a temporal change image is generated via first and second images acquired using *different imaging modalities*. Further, in view of

the above discussion, the Roehrig reference fails to obviate the deficiencies of Kano. Accordingly, dependent claims 6-8 are believed to be clearly patentable at least by virtue of their dependency from independent claim 1.

Dependent claims 10-13 and 17

Dependent claims 10-13 and 17 each depend from claim 9 and were rejected by the Examiner based on Kano in combination with one or both of the Roehrig and Nishikawa references. However, as discussed above, Kano fails to disclose each and every element recited by independent claim 9. Specifically, Kano fails to disclose that a *first image* is analyzed using a CAD algorithm, and that the results of such analysis is used in accessing a *second image*, whereby a temporal change image is generated using the first and second images. Applicants respectfully submit that Roehrig and Nishikawa references fail to obviate the deficiencies of Kano. Accordingly, dependent claims 10-13 and 17 are believed to be clearly patentable at least by virtue of their dependency from independent claim 1.

Further, Applicants submit that dependent claim 10 is also allowable for the subject matter separately recited therein. For instance, dependent claim 10 generally recites reporting results of a CAD analysis to a user if a feature of interest is *not* identified in the first image. In rejecting claim 10, the Examiner alleged that Roehrig discloses this feature. Applicants respectfully disagree. In contrast, Roehrig states that a report *identifying each of the nodules* in the image (e.g., features of interest) may be automatically generated using data from a nodule detection logic block. *See* Roehrig, col. 14, lines 51-62. That is, Roehrig appears to only disclose that a report is generated *if a feature of interest is identified*. However, Applicants are unable to identify any teaching in Roehrig which suggests that a report is generated if a feature of interest is *not* identified. Accordingly, Applicants respectfully submit that dependent claim 10 is also allowable for the subject matter additionally recited therein.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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/Patrick S. Yoder/

Patrick S. Yoder
Reg. No. 37,479
FLETCHER YODER
P.O. Box 692289
Houston, TX 77269-2289
(281) 970-4545